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AUTHOR Head, Ronald B.
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ABSTRACT

To supplement the academic review process and provide information on trends in occupational/technical programs (OT), a study was conducted at Piedmont Virginia Community College (PVCC) to examine student enrollment, student completion, and occupational opportunities for graduates of the college's OT programs. Student enrollment and graduation data for fall 1991 through fall 1993 were collected from Virginia Community College System publications on enrollment and awards conferred. In addition, current occupational data were collected from the ninth edition of "Guide to Occupations in Virginia." Study findings included the following: (1) for the 3 years under study, slightly more than one-third of all curricular students at PVCC were enrolled in OT programs; (2) and average of 28.7% of these students were classified as Business and Management majors, 29.6% as Nursing, and 15.7% as Computer Systems; (3) 49.6% of all PVCC graduates for the period were OT students; (4) Business and Management, Computer Systems, Nursing, and Police Science programs all met state productivity standards in terms of enrollment and graduation of students, while Business and Office and Electronics met enrollment but not graduation standards; (5) Mechanical Technology and Respiratory Therapy did not meet either standards, with the latter being discontinued in 1991-92; and (6) occupational growth from 1988 through 2000 was generally calculated as high, with five programs among the fastest growing occupations in Virginia. A monitoring system for classifying programs was recommended to ensure more accurate student classification in future. (KP)

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PIEDMONT VIRGINIA COMMUNITY COLLEGE

Occupational/Technical Programs at Piedmont Virginia Community College

Office of Institutional
Research and Planning
Piedmont Virginia
Community College
Charlottesville, Virginia

Research Report
Number 3–94

March 1994

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Ronald B. Head (Author)
Coordinator of Institutional Research and Planning
Piedmont Virginia Community College

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Brief No. 94-4

PVCC Institutional Research Brief

March 1994

OCCUPATIONAL/TECHNICAL PROGRAMS AT PVCC

This brief highlights the findings in *Occupational/Technical Programs at Piedmont Virginia Community College* (PVCC Institutional Research Report No. 3-94, March 1994), a study designed to examine occupational/technical programs at Piedmont Virginia Community College (PVCC) with respect to student enrollment, student completion, and occupational opportunities for graduates. The study is intended to supplement the academic review process, as currently conducted at the college, and is to be used in conjunction with the annual graduate survey studies and employer survey studies published by the Office of Institutional Research and Planning.

Occupational/technical students typically constitute approximately one-third of all curricular students and FTES enrolled at PVCC.[1] Of these occupational/technical students, nearly one-third are enrolled in the Business and Management program. The next largest programs in terms of student enrollment are Nursing and Computer Information Systems. In terms of student completion, approximately one-half of all graduates receive degrees in occupational/technical areas. Occupational/technical students, in other words, are much more likely to complete their degrees or certificates than are college transfer students.

Measuring AAS programs during a three-year average period against SCHEV productivity standards, four programs--Business and Management, Computer Information Systems, Nursing, and Police Science--met both FTES enrollment and graduation standards.[2] Two programs--Business and Office, and Electronics--met FTES enrollment standards but did not meet graduation standards. Two programs--Mechanical Technology and Respiratory Therapy--met neither FTES enrollment nor graduation standards. Respiratory Therapy was discontinued in 1991-92.

Generally, the growth rates for occupations for which PVCC occupational/technical programs prepare workers are quite high. Similarly, there seem to be ample job

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[1]One FTES, or full-time equivalent student, is generated for every 15 student credit hours.

[2]"Productivity standards require that programs have an average of . . . 7 or more A.A.S. degrees . . . The requirement for FTE majors is 2.5 times that for graduation" (SCHEV Proposal for Program To Be Initiated in 1992-1994 Biennium, Feb. 9, 1989). Eighteen FTES, then, are needed for each AAS program to meet the SCHEV requirement (2.5 times 7 graduates). Please note that the AAS program in Business and Management has three majors: Accounting, Management, and Marketing. Although these are referred to as majors in the college *Catalog*, they are really areas of specialization and not college majors.

(Continued on reverse side)

opportunities in occupations for which PVCC occupational/technical programs prepare workers.

The major problem encountered while conducting the study involved student program classification within the computerized student database. A number of students were classified as enrolled in certificate programs which are not currently offered by the college. Clearly, a monitoring system for program classification should be implemented. In these times of tight budgets and public accountability, failing to do so could jeopardize the very future of a number of instructional programs at PVCC.

OCCUPATIONAL/TECHNICAL PROGRAMS AT PIEDMONT VIRGINIA COMMUNITY COLLEGE

Ronald B. Head (Author)
Coordinator of Institutional Research and Planning
Piedmont Virginia Community College

Office of Institutional Research and Planning
Piedmont Virginia Community College
Charlottesville, Virginia 22901
Research Report No. 3-94

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OCCUPATIONAL/TECHNICAL PROGRAMS AT PIEDMONT VIRGINIA COMMUNITY COLLEGE

INTRODUCTION

In 1989, the Office of Institutional Research and Planning at Piedmont Virginia Community College (PVCC) published a study on occupational/technical programs offered by the college. As noted in the introduction,

> The purpose of this study is to supplement the academic review process by examining PVCC's occupational/technical programs with respect to enrollment, completion, and occupational opportunities. Key trends in both the occupational/technical programs themselves and the professions in which programs graduates are employed are identified, and an attempt is made to apply various criteria by which the programs can be measured. When combined with the annual graduate survey reports and employer survey reports, this study provides a fairly detailed examination of occupational/technical programs and student outcomes.[1]

Three recommendations emerged from the study. First, it was recommended that "efforts . . . be intensified to ensure that students are correctly coded in the VCCS [Virginia Community College System] database with respect to the curriculum in which they are enrolled."[2] The second recommendation was that "a community needs assessment be conducted in the near future."[3] The third recommendation was that the entire academic review process be re-examined and improved.

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[1]Ronald B. Head, *Occupational/Technical Programs at Piedmont Virginia Community College* (PVCC Institutional Research Report No. 3-89, April 1989), p. 2.

[2]*Ibid.*, p. 21.

[3]*Ibid.*, p. 21.

All three recommendations were acted upon. PVCC's Office of Admissions and Records (A&R), in conjunction with the academic divisions of the college, took steps to insure that students were being correctly coded with respect to their degree programs. A community needs survey was distributed in 1991 and the results were used in formulating college goals and priorities.[4] A new academic program review process was adopted and implemented during the 1990-91 academic year.

A follow-up study was conducted in 1991.[5] Because problems still existed at the college with respect to properly coding students according to their curricula, one recommendation emerged from the follow-up study. The recommendation was that once a year a list of all students enrolled in all curricula be generated by the Office of Administrative Computing and used by instructional services staff to insure that students on the list were properly coded. This recommendation was not adopted.

This present study is a follow-up to both the 1989 and 1991 studies. Its purpose is to supplement the academic review process and provide key trends and information concerning occupational/technical programs at PVCC.

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[4]Ronald B. Head, *Serving the Community: Results of the 1991 PVCC Community Survey* (PVCC Institutional Research Report No. 4-91, August 1991).

[5]Ronald B. Head, *Occupational/Technical Programs at Piedmont Virginia Community College* (PVCC Institutional Research Report No. 3-91, May 1991).

OCCUPATIONAL/TECHNICAL PROGRAMS AT PVCC

One of the primary missions of Piedmont Virginia Community College (PVCC) is to provide occupational/technical education for citizens within its service region. As defined in PVCC's mission statement,

> The occupational and technical education programs are designed to meet the increasing demand for technicians, semiprofessional workers, [and] skilled craftsmen for employment in industry, business, the professions, and government. The curricula are planned primarily to provide workers for the region served by the college.[6]

Occupational/technical programs lead to an Associate of Applied Science (AAS) degree, a certificate, or a career studies certificate. Additionally, in the past, PVCC has offered occupational/technical programs leading toward diplomas. Presently, the college offers seven AAS programs, three certificate programs, and seven career studies certificate programs.

The seven AAS programs are (1) Business and Management (with majors in Accounting, General Management [with specializations in Banking, Finance, and Construction Management], and Marketing with a specialization in Real Estate); (2) Business and Office (with a major in Office Systems Technology); (3) Computer Information Systems (with specializations in Programming and Microcomputers for Business); (4) Electrical/Electronics Technology (with a major in Electronics Technology); (5) Mechanical Technology (with a major in Computer-Aided Drafting and Design); (6) Nursing; and (7) Protective Services (with a major in Police Science). The AAS programs in Science Laboratory

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[6]*Piedmont Virginia Community College 1993-1994 Catalog*, p. 2.

Technology and Respiratory Therapy, mentioned in the earlier studies, have been discontinued.

The three certificate programs are (1) Automotive Technology, (2) Administration of Justice, and (3) Business and Office. A certificate program in Arts and Crafts was formerly offered, but was changed to a Career Studies Certificate program, and then finally eliminated. Despite this, people coded as Arts and Crafts students still attend PVCC. For this reason, the certificate program in Arts and Crafts is included in this study (even though technically it does not exist).

The seven career studies certificate programs are (1) Business and Management, (2) Business and Office, (3) Child Care, (4) Computer Information Systems, (5) Computer-Aided Drafting Technology, (6) Electronics Technology, and (7) Industrial Mechanics. Career studies certificate programs in Arts and Crafts, General Education, and Health Technology, offered in recent years and reported in the 1989 and 1991 studies, have been discontinued at PVCC.

As noted above, all instructional programs at PVCC, including occupational/technical programs, are subjected to an academic program review process every five years. Academic program review is conducted through the college's Curriculum and Instruction Committee and has been designed to insure that each program is thoroughly reviewed and that the results are used to improve the curriculum. The process includes a review of the program's goals and objectives, enrollment and graduate trends, cost analysis, skills and knowledge acquired from the program, student satisfaction, counseling and advising services, graduate placement, employer satisfaction with graduates, current and predicted employment opportunities, transfer rates to four-year colleges, faculty qualifications,

primary teaching methods, curriculum review procedures, and student outcomes assessment.

METHODOLOGY AND LIMITATIONS

Three major sources of data were used in conducting the study. Student enrollment data were collected from the VCCS Student Enrollment Booklets published electronically each term by the VCCS. Student graduation data were collected from the VCCS Graduation Awards Conferred Booklets published electronically each year by the VCCS. Occupational data were collected from the ninth edition of *Guide to Occupations in Virginia* (formerly titled *Virginia Occupational Demand, Supply and Wage Information*, and referred to as *VODSWI*).[7] The *Guide to Occupations in Virginia* is hereafter referred to as *GOV*.

Although this study provides a great deal of useful information for both instructional support staff and teaching faculty in the occupational/technical areas, some of the limitations of the study should be noted.

First, and most importantly, the study is not meant to be a rigorous and authoritative evaluation of occupational/technical programs. Rather, the various evaluation criteria used in the study are intended to generate discussion of the strengths and weaknesses of the programs.

Second, although student enrollment and graduation data are authoritative in the sense that they are the sources used by the VCCS to monitor academic programs, student

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[7]Julia H. Martin *et al.*, *Guide to Occupations in Virginia, Virginia and Central and Northeast*, Virginia and Central and Northeast versions, 9th edition (Charlottesville: Virginia Occupational Information Coordinating Committee, Center for Public Service, Spring 1993).

enrollment, and student program completion, in some cases they are neither valid nor reliable. For instance, PVCC has not offered a diploma in Drafting Design since the early 1980's, yet as late as Fall Semester 1989, one student was classified as enrolled in the diploma program for Drafting Design. And, as noted above, although the certificate program in Arts and Crafts is not currently offered by the college, students are still classified as enrolled in the program.

Clearly, although efforts have been made to correctly classify students, problems still exist. Not only must students be correctly classified upon entry into an instructional program but their classification must be monitored on a regular basis. Without regular monitoring, a change from one curriculum to another will not be reflected in the VCCS student database, and in a worst case scenario, the State Council of Higher Education for Virginia (SCHEV) might recommend that a program be discontinued based upon erroneous data. Monitoring procedures used by A&R should be evaluated periodically, and data reported by A&R should be reviewed by academic administrators and faculty to ensure accuracy.

Another limitation of the study is that data for the career studies certificate are reported in aggregate form only and not by the seven different program areas. In this respect, it was impossible to compare enrollment and graduate data with occupational growth and job openings. Although internal codes are assigned for each career studies certificate program, these codes are not reflected in the VCCS Student Enrollment Booklets.

Still another limitation of the study is that occupational information is reported for Service Delivery Area 7 (SDA 7), which closely but not exclusively approximates PVCC's

service region. The PVCC service region consists of the counties of Albemarle, Fluvanna, Greene, Louisa, and Nelson, the northern half of Buckingham County, and the city of Charlottesville. SDA 7 consists of the counties of Albemarle, Culpeper, Fauquier, Fluvanna, Greene, Louisa, Madison, Nelson, Orange, and Rappahannock, and the city of Charlottesville.

Finally, occupational data do not in all cases match program data as precisely as might be desired. For instance, while it is easy to relate the major in Accounting in the Business and Management program to the *GOV* category of *Accountant/Auditor*, it is less easy to relate the Arts and Crafts program to *GOV* categories. Although the Arts and Crafts program was not really designed to produce primarily commercial artists, designers, photographers, or performing artists, these were the most relevant *GOV* categories.

STUDENT ENROLLMENT IN OCCUPATIONAL/TECHNICAL PROGRAMS

During any particular academic term, slightly more than one-third of all curricular students are enrolled in occupational/technical programs.[8] In terms of the number of students enrolled, programs and majors range from 1 or 2 to more than 200. The number of fall term students enrolled in occupational/technical programs during the past three years is presented in Table 1. As can be seen, nearly one-third of all occupational/technical stu-

TABLE 1: NUMBER OF PVCC FALL TERM STUDENTS BY OCCUPATIONAL/TECHNICAL PROGRAM

ACADEMIC PROGRAM	Fall 1991 No.	Fall 1991 Pct.	Fall 1992 No.	Fall 1992 Pct.	Fall 1993 No.	Fall 1993 Pct.	AVERAGE No.	AVERAGE Pct.
Arts & Crafts (Cert.)	1	0.1%	2	0.3%	1	0.1%	1	0.2%
BUSINESS & MANAGEMENT								
Accounting (AAS)	64	9.4%	55	7.9%	71	10.0%	63	9.1%
Management (AAS)	111	16.3%	118	17.0%	122	17.1%	117	16.8%
Marketing (AAS)	21	3.1%	21	3.0%	17	2.4%	20	2.8%
BUSINESS & OFFICE								
Office Systems (AAS)	61	9.0%	61	8.8%	60	8.4%	61	8.7%
Clerical Studies (Cert.)	3	0.4%	3	0.4%	7	1.0%	4	0.6%
Computer Systems (AAS)	101	14.8%	111	16.0%	116	16.3%	109	15.7%
ELECTRONICS								
Electronics (AAS)	52	7.6%	60	8.6%	52	7.3%	55	7.9%
Electronics (Cert.)	0	0.0%	1	0.1%	2	0.3%	1	0.1%
Health Technology (Cert.)	3	0.4%	2	0.3%	1	0.1%	2	0.3%
MECHANICAL TECHNOLOGY								
Drafting & Design (AAS)	21	3.1%	30	4.3%	13	1.8%	21	3.1%
Drafting (Cert.)	21	3.1%	0	0.0%	1	0.1%	7	1.1%
Drafting Design (Diploma)	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Nursing (AAS)	124	18.2%	138	19.9%	146	20.5%	136	19.6%
POLICE SCIENCE								
Police Science (AAS)	57	8.4%	61	8.8%	70	9.8%	63	9.0%
Law Enforcement (Cert.)	1	0.1%	3	0.4%	3	0.4%	2	0.3%
Respiratory Therapy (AAS)	11	1.6%	2	0.3%	1	0.1%	5	0.7%
Auto Mechanics (Cert.)	1	0.1%	1	0.1%	3	0.4%	1	0.1%
CAREER STUDIES CERTIFICATE	28	4.1%	25	3.6%	27	3.8%	27	3.8%
TOTAL	681	30.1%	694	32.1%	713	31.6%	695	33.3%

SOURCE: PVCC Management Information Book, 1993. Percentages are by column except for the final row which is the percentage of occupational/ technical students among all curricular students.

[8]The other two-thirds are enrolled in college transfer programs. College transfer programs are those leading to the Associate in Arts (AA) degree or Associate in Science (AS) degree. The purpose of these programs is "to prepare students for transfer to four-year baccalaureate programs" (PVCC *1993-1994 Catalog*, p. 27).

dents were enrolled in the Business and Management program. The next largest programs in terms of student enrollment were Nursing and Computer Information Systems. The three smallest programs were the certificate programs in Auto Mechanics, Arts and Crafts, and Electronics.

It should be noted that the figures in Table 1 refer to the number of students who were officially classified as majors in the various programs. The figures do not refer to the number of students taking classes in the various program areas. This is an important distinction to bear in mind. For instance, during Fall Semester 1993, one student was classified as being enrolled in Arts and Crafts, yet 306 students took classes in Arts and Crafts.

Another way to review academic program enrollment is to examine the number of FTES reported for each program. One FTES, or full-time equivalent student, is generated for every 15 student credit hours. FTES enrollment is important for two reasons. First, institutional funding is based upon the number of annualized FTES. Secondly, one measure of academic program productivity used by SCHEV is to calculate the number of FTES enrolled in each associate degree program. According to SCHEV guidelines, an average of 18 FTES should be enrolled in an AAS program each year.[9]

Table 2 presents the number of fall term FTES enrolled in each occupational/technical program at PVCC during the past three years and indicates whether the AAS programs met the SCHEV standard. It should be noted that the FTES figures in

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[9]"Productivity standards require that programs have an average of . . . 7 or more A.A.S. degrees . . . The requirement for FTE majors is 2.5 times that for graduation" (SCHEV Proposal for Program To Be Initiated in 1992-1994 Biennium, Feb. 9, 1989). Eighteen FTES, then, are needed for each AAS program to meet the SCHEV requirement (2.5 times 7 graduates). Please note that the AAS program in Business and Management has three majors: Accounting, Management, and Marketing. Although these are referred to as majors in the college *Catalog*, they are really areas of specialization and not college majors.

TABLE 2: NUMBER OF PVCC FTES BY OCCUPATIONAL/TECHNICAL PROGRAM

ACADEMIC PROGRAM	Fall 1991 No.	Fall 1991 Pct.	Fall 1991 Meets SCHEV Standard	Fall 1992 No.	Fall 1992 Pct.	Fall 1992 Meets SCHEV Standard	Fall 1993 No.	Fall 1993 Pct.	Fall 1993 Meets SCHEV Standard	AVERAGE No.	AVERAGE Pct.	AVERAGE Meets SCHEV Standard
Arts & Crafts (Cert.)	0	0.0%	N/A	0	0.0%	N/A	0	0.0%	N/A	0	0.0%	N/A
BUSINESS & MANAGEMENT			Yes			Yes			Yes			Yes
Accounting (AAS)	28	8.2%		22	6.7%		29	8.7%		26	7.9%	
Management (AAS)	45	13.1%		47	14.3%		42	12.7%		45	13.3%	
Marketing (AAS)	12	3.5%		10	3.0%		7	2.1%		10	2.9%	
BUSINESS & OFFICE												
Office Systems (AAS)	36	10.5%	Yes	31	9.4%	Yes	32	9.6%	Yes	33	9.9%	Yes
Clerical Studies (Cert.)	2	0.6%		2	0.6%		2	0.6%		2	0.6%	
Computer Systems (AAS)	50	14.6%	Yes	49	14.9%	Yes	60	18.1%	Yes	53	15.8%	Yes
ELECTRONICS												
Electronics (AAS)	25	7.3%	Yes	29	8.8%	Yes	24	7.2%	Yes	26	7.8%	Yes
Electronics (Cert.)	0	0.0%		0	0.0%		0	0.0%		0	0.0%	
Health Technology (Cert.)	0	0.0%	N/A	0	0.0%	N/A	0	0.0%	N/A	0	0.0%	N/A
MECHANICAL TECHNOLOGY												
Drafting & Design (AAS)	8	2.3%	No	14	4.3%	No	7	2.1%	No	10	2.9%	No
Drafting (Cert.)	8	2.3%		0	0.0%		0	0.0%		3	0.8%	
Drafting Design (Diploma)	0	0.0%		0	0.0%		0	0.0%		0	0.0%	
Nursing (AAS)	79	23.0%	Yes	82	24.9%	Yes	75	22.6%	Yes	79	23.5%	Yes
POLICE SCIENCE												
Police Science (AAS)	35	10.2%	Yes	36	10.9%	Yes	44	13.3%	Yes	38	11.5%	Yes
Law Enforcement (Cert.)	0	0.0%		1	0.3%		1	0.3%		1	0.2%	
Respiratory Therapy (AAS)	7	2.0%	No	0	0.0%	No	0	0.0%	No	2	0.7%	No
Auto Mechanics (Cert.)	1	0.3%	N/A	1	0.3%	N/A	2	0.6%	N/A	1	0.4%	N/A
CAREER STUDIES CERTIFICATE	7	2.0%	N/A	5	1.5%	N/A	7	2.1%	N/A	6	1.9%	N/A
	343	27.4%		329	27.1%		332	26.6%		335	28.7%	

SOURCE: PVCC Management Information Book, 1993. Percentages are by column except for the final row which is the percentage of occupational/technical FTES among all FTES. SCHEV productivity standards "require that programs have an average of . . . 2.5 times that for graduation" (SCHEV Proposal for Program To Be Initiated in 1992-1994 Biennium, Feb. 9, 1989). Each A.A.S. program, then, requires 18 FTES (7 graduates times 2.5). SCHEV does not set productivity standards for certificates or diplomas.

Table 2 are generated from the credit hours of students officially classified as occupational/technical students and not from the credit hours of students taking classes in the occupational/technical areas. The distinction is important. For instance, the FTES

generated by students taking classes in Arts and Crafts during Fall Semester 1993 was 73, yet the FTES generated by students officially enrolled in Arts and Crafts was 0.

As can be seen, the 1991-93 three-year average number of FTES enrolled in occupational/technical programs ranged from 0 in several discontinued certificate programs (Arts and Crafts and Health Technology) to 81 for the AAS program in Business and Management. Occupational/technical program FTES account for approximately one-third of all curricular FTES. This is a slightly lower figure than that for headcount, indicating that college transfer students normally carry a slightly heavier course load than occupational/technical students.

Examining only the AAS programs, six met SCHEV productivity standards during each of the past three years. These five were Business and Management, Business and Office, Computer Information Systems, Electronics, Nursing, and Police Science. The AAS programs in Mechanical Technology and Respiratory Therapy (discontinued in 1991-92) did not meet the standard during any of the three years.

STUDENT COMPLETION OF OCCUPATIONAL/TECHNICAL PROGRAMS

Although only about one-third of all curricular students are enrolled in occupational/technical programs, one-half of all PVCC graduates receive degrees in occupational/technical programs (AAS, certificates, and career studies certificates). For instance, while 30% of all curricular students during Fall Semester 1992 were enrolled in occupational/technical programs, 49.6% of all graduates during the 1992-93 academic year were occupational/technical graduates.

In other words, occupational/technical students are much more likely to complete their programs than are college transfer students. The reason for this may be that the goal of college transfer students is to transfer to a four-year, baccalaureate-granting institution and not necessarily to receive an associate degree at PVCC. Many of these students, in fact, do transfer to four-year colleges or universities before completing their PVCC degree requirements. Still, it is important for academic administrators to keep in mind that although fewer students enroll in occupational/technical programs than enroll in college transfer programs, more occupational/technical students graduate.

TABLE 3: NUMBER OF PVCC GRADUATES BY OCCUPATIONAL/TECHNICAL PROGRAM

ACADEMIC PROGRAM	1990-1991 No.	1990-1991 Pct.	1990-1991 Meets SCHEV Standard	1991-1992 No.	1991-1992 Pct.	1991-1992 Meets SCHEV Standard	1992-1993 No.	1992-1993 Pct.	1992-1993 Meets SCHEV Standard	AVERAGE No.	AVERAGE Pct.	AVERAGE Meets SCHEV Standard
Arts & Crafts (Cert.)	0	0.0%	N/A	0	0.0%	N/A	0	0.0%	N/A	0	0.0%	N/A
BUSINESS & MANAGEMENT			Yes			Yes			Yes			Yes
Accounting (AAS)	12	9.8%		7	5.6%		2	1.8%		7	5.9%	
Management (AAS)	10	8.2%		7	5.6%		11	9.9%		9	7.8%	
Marketing (AAS)	4	3.3%		3	2.4%		0	0.0%		2	2.0%	
BUSINESS & OFFICE												
Office Systems (AAS)	5	4.1%	No	3	2.4%	No	5	4.5%	No	4	3.6%	No
Clerical Studies (Cert.)	1	0.8%		1	0.8%		1	0.9%		1	0.8%	
Computer Systems (AAS)	10	8.2%	Yes	9	7.2%	Yes	8	7.2%	Yes	9	7.5%	Yes
ELECTRONICS												
Electronics (AAS)	8	6.6%	Yes	2	1.6%	No	3	2.7%	No	4	3.6%	No
Electronics (Cert.)	0	0.0%		0	0.0%		0	0.0%		0	0.0%	
Health Technology (Cert.)	0	0.0%	N/A	0	0.0%	N/A	0	0.0%	N/A	0	0.0%	N/A
MECHANICAL TECHNOLOGY												
Drafting & Design (AAS)	1	0.8%	No	2	1.6%	No	1	0.9%	No	1	1.1%	No
Drafting (Cert.)	1	0.8%		0	0.0%		0	0.0%		0	0.3%	
Drafting Design (Diploma)	0	0.0%		0	0.0%		0	0.0%		0	0.0%	
Nursing (AAS)	42	34.4%	Yes	37	29.6%	Yes	47	42.3%	Yes	42	35.1%	Yes
POLICE SCIENCE												
Police Science (AAS)	7	5.7%	Yes	4	3.2%	No	13	11.7%	Yes	8	6.7%	Yes
Law Enforcement (Cert.)	1	0.8%		6	4.8%		9	8.1%		5	4.5%	
Respiratory Therapy (AAS)	4	3.3%	No	9	7.2%	Yes	1	0.9%	No	5	3.9%	No
Auto Mechanics (Cert.)	0	0.0%	N/A	0	0.0%	N/A	1	0.9%	N/A	1	0.4%	N/A
CAREER STUDIES CERTIFICATE	16	13.1%	N/A	35	28.0%	N/A	9	8.1%	N/A	20	16.7%	N/A
TOTAL	122	52.8%		125	52.5%		111	48.1%		120	50.3%	

SOURCE: PVCC Management Information Book, 1993. Percentages are by column except for the final row which is the percentage of occupational/technical graduates among all graduates. SCHEV productivity standards required that programs have an average of . . . 7 or more A.A.S. degrees . . . annually" (SCHEV Proposal for Program To Be Initiated in 1992-1994 Biennium, Feb. 9, 1989). SCHEV does not set productivity standards for certificates or diplomas.

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As noted earlier, SCHEV has set numerical standards not only for FTES enrollment in occupational/technical programs but also for program completion. Each program leading toward an AAS degree should produce an average of seven graduates per year. Table 3 presents PVCC occupational/technical graduates during the past three years and indicates whether the programs met the SCHEV standard during that time.

As can be seen, only three of the AAS programs met the SCHEV graduation standards during each of the previous three years. These were Business and Management, Computer Information Systems, and Nursing. Another AAS program, Police Science, met the SCHEV standard for two of the three previous years, and two programs, Electronics and Respiratory Therapy, met the standard for one of the three years. The AAS programs in Business and Office and Mechanical Technology did not meet the SCHEV standard during any of the previous three years.

By far the most productive AAS program was Nursing, producing an average of 42 graduates per year. Next was Business and Management, with an average of 18 graduates per year, and then Police Science, with 13 graduates.

Certificate programs typically produce one or two graduates per year, and between 9 and 35 career studies certificates are awarded each year. In 1993-94, one certificate in Clerical Studies was awarded, 9 certificates in Administration of Justice (law enforcement), one in Clerical Studies, and 9 in Career Studies.

OCCUPATIONAL GROWTH AND DEMAND

Occupational/technical programs in a community college are provided to meet community needs. Programs designed to provide workers for occupations requiring few workers or having little growth potential may have trouble enrolling students or may produce graduates who have trouble finding jobs, both undesirable outcomes for an educational program. For this reason, occupational/technical programs should be periodically reviewed to ensure they are meeting community needs. This section attempts to provide a limited review of occupational growth and demand with respect to PVCC occupational/technical programs. Career studies certificate programs are not included in this section because they are intended for workers already employed in career fields.

Table 4 presents the occupational growth rate for each *GOV* occupation for which one of PVCC's AAS or certificate programs prepares workers. Occupational growth is expressed as the percentage of change between the years 1988 and 2000 and is shown for both SDA 7 and the state of Virginia as a whole.

TABLE 4: OCCUPATIONAL GROWTH BY PVCC OCCUPATIONAL/TECHNICAL PROGRAM

ACADEMIC PROGRAM	RELATED OCCUPATION	Percent Change 1988 to 2000 SDA 7	Percent Change 1988 to 2000 Virginia
Arts & Crafts (Cert.)	Artist	43.3%	40.8%
	Designer	33.5%	26.2%
	Photographer	42.1%	47.9%
	Performing Artist	NA	32.4%
BUSINESS & MANAGEMENT			
Accounting (AAS)	Accountant/Auditor	29.1%	28.3%
Management (AAS)	Managers (General)	23.9%	23.7%
	Managers (Personnel)	24.0%	29.2%
	Sales Workers/Managers	29.1%	25.8%
	Finance Officers/Managers	28.0%	31.3%
	Bank Tellers/etc.	33.4%	32.1%
Marketing (AAS)	Advertising/Public Relations	27.8%	32.4%
BUSINESS & OFFICE			
Office Systems (AAS)	Office Supervisors	19.8%	22.2%
Clerical Studies (Cert.)	Secretaries	12.9%	19.7%
	General Office Clerks	17.2%	21.0%
	Bookkeepers	9.4%	9.3%
	Clerical Worker	25.0%	26.2%
Computer Systems (AAS)	Programmers and Aides	43.2%	53.2%
	Computer Operator	23.4%	33.1%
	Data Entry Operator	-1.1%	0.3%
ELECTRONICS			
Electronics (AAS)	Electronics Technician	28.1%	42.3%
Electronics (Cert.)	Electrician	21.6%	23.3%
Health Technology (Cert.)	Medical Assistant	57.3%	63.7%
	Nursing/Medical Aide	48.5%	51.3%
	Radiologic Technologist	71.2%	73.6%
	Health Record Technologist	76.1%	72.5%
MECHANICAL TECHNOLOGY			
Drafting & Design (AAS)	Drafter	7.3%	11.4%
Drafting (Cert.)			
Drafting Design (Diploma)			
Nursing (AAS)	Registered Nurse	52.6%	53.2%
	Licensed Practical Nurse	44.3%	47.8%
POLICE SCIENCE			
Police Science (AAS)	Corrections/Law Enforcement	33.3%	29.0%
Law Enforcement (Cert.)	Private Guard	27.9%	42.7%
Respiratory Therapy (AAS)	Respiratory Therapist	62.0%	61.3%
Science Laboratory (AAS)	Clinical Lab Technician	21.9%	28.7%

SOURCE: Julia H. Martin et al., Guide to Occupations in Virginia, Virginia and Central and Northeast, 9th edition (Charlottesville, Virginia Occupational Information Coordinating Committee, Center for Public Service, Spring 1993.

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Projected growth rates within SDA 7 range from -1.1% for data entry operators to 76.1% for health record technologists and within Virginia from 0.3% for data entry operators to 73.6% for radiologic technologists. Several occupations relating to PVCC occupational/technical programs are among the 25 fastest growing occupations in Virginia. These are radiologic technologist (5th), health records technologist (7th), medical assistant (15th), respiratory therapist (17th), and computer programmer (24th). Several are also among the 25 slowest growing occupations in Virginia. These are stenographer (6th), data entry operator (13th), and typist (15th).

Caution should be exercised when examining these figures. For instance, the low growth rate for drafters is somewhat misleading. As noted in *GOV*, "in Virginia growth should be below average [because] although a large increase is expected in the demand of drafting services, it will be partially offset by the widespread use of computer-aided design equipment which increases the productivity of drafters."[10] PVCC's mechanical technology program, however, is designed to produce CAD system drafters, and these graduates should have an advantage over other drafters trained by conventional means.

Some fields, such as health records technologist, respiratory therapist, and radiologic technologist, have future growth potential but few present job openings. Table 5 presents occupational demand for each *GOV* occupation for which one of PVCC's AAS or certificate programs prepares workers.

Occupational demand is expressed in this table as the average number of annual job openings for both SDA 7 and the state of Virginia. The average annual job openings

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[10]*GOV*, p. 123.

listed in Table 5 are conservative estimates. In this study, average annual job openings are defined as

> . . . the number of openings expected to occur each year in [an] occupation. This includes openings that result from the creation of new jobs or from vacancies left by people leaving the labor force, but it does *not* include openings that result from job turnover. Consequently, the *actual* number of openings occurring each year will be greater than the *projected* average annual openings shown.[11]

[11] *Ibid.*, p. xxxix.

TABLE 5: OCCUPATIONAL DEMAND BY PVCC OCCUPATIONAL/TECHNICAL PROGRAM

ACADEMIC PROGRAM	RELATED OCCUPATION	Average Annual Job Openings SDA 7	Average Annual Job Openings Virginia
Arts & Crafts (Cert.)	Commercial Artist	6	155
	Designer	10	319
	Photographer	2	104
	Performing Artist	NA	78
BUSINESS & MANAGEMENT			
Accounting (AAS)	Accountant/Auditor	53	1,230
Management (AAS)	Managers (General)	193	5,231
	Managers (Personnel)	22	804
	Sales Workers/Managers	513	13,556
	Finance Officers/Managers	43	1,513
	Bank Teller/etc.	44	1,446
Marketing (AAS)	Advertising/Public Relations	26	772
BUSINESS & OFFICE			
Office Systems (AAS)	Office Supervisors	60	1,655
Clerical Studies (Cert.)	Secretaries	147	4,125
	General Office Clerks	219	6,155
	Bookkeepers	86	2,414
	Clerical Worker	208	5,753
Computer Systems (AAS)	Programmers and Aides	28	1,463
	Computer Operator	13	447
	Data Entry Operator	10	311
ELECTRONICS			
Electronics (AAS)	Electronics Technician	21	708
Electronics (Cert.)	Electrician	45	1,145
Health Technology (Cert.)	Medical Assistant	7	260
	Nursing/Medical Aide	104	2,226
	Radiologic Technologist	12	277
	Health Record Technologist	5	96
MECHANICAL TECHNOLOGY			
Drafting & Design (AAS)	Drafter	7	331
Drafting (Cert.)			
Drafting Design (Diploma)			
Nursing (AAS)	Registered Nurse	121	2,580
	Licensed Practical Nurse	49	1124
POLICE SCIENCE			
Police Science (AAS)	Corrections/Law Enforcement	47	1,212
	Private Guard	37	1,484
Respiratory Therapy (AAS)	Respiratory Therapist	8	92
Science Laboratory (AAS)	Clinical Lab Technician	11	304

SOURCE: Julia H. Martin et al., Guide to Occupations in Virginia, Virginia and Central and Northeast, 9th edition (Charlottesville, Virginia Occupational Information Coordinating Committee, Center for Public Service, Spring 1993.

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The average annual job openings within SDA 7 for the occupations listed in Table 5 range from 2 for photographer to 513 for sales workers and sales managers. The programs with the fewest average annual job openings are the certificate program in Arts and Crafts and the AAS programs in Mechanical Technology and Respiratory Therapy. The two programs with the most average annual job openings are the program in Business and Management and the program in Business and Office.

TABLE 6: OCCUPATIONAL DEMAND FOR PVCC OCCUPATIONAL/TECHNICAL PROGRAM GRADUATES AND STUDENTS

ACADEMIC PROGRAM	No. PVCC Graduates for each SDA 7 Job Opening	No. PVCC Students for each SDA 7 Job Opening
Arts & Crafts (Cert.)	0.0	0.1
BUSINESS & MANAGEMENT		
Accounting (AAS)	0.1	1.2
Management (AAS)	0.0	0.1
Marketing (AAS)	0.1	0.8
BUSINESS & OFFICE Office Systems (AAS) Clerical Studies (Cert.)	0.0	0.2
Computer Systems (AAS)	0.2	2.1
ELECTRONICS Electronics (AAS) Electronics (Cert.)	0.1	0.8
Health Technology (Cert.)	0.0	0.0
MECHANICAL TECHNOLOGY Drafting & Design (AAS) Drafting (Cert.) Drafting Design (Diploma)	0.2	4.1
Nursing (AAS)	0.2	0.8
POLICE SCIENCE Police Science (AAS) Law Enforcement (Cert.)	0.2	0.8
Respiratory Therapy (AAS)	0.6	0.6
Science Laboratory (AAS)	0.0	0.1

NOTE: The number of PVCC graduates and students available for each SDA 7 job opening is calculated by dividing the three year average number of graduates or students (see Tables 1 or 3) by the average annual job openings (see Table 5).

The occupational demand figures presented in Table 5 are only meaningful when placed in context with PVCC occupational/technical program enrollment and completion figures. Table 6 lists both the number of PVCC graduates and the number of PVCC fall term students for each SDA 7 job opening. The lower the number, the higher the demand for PVCC occupational/technical students and graduates. In Business and Office, for instance, there are approximately 100 jobs for each PVCC graduate and approxi-

mately five jobs for each fall term student; in Mechanical Technology, however, there are roughly five jobs for every graduate, but approximately four fall term students must compete for each job opening.

There does not seem to be an over supply of PVCC graduates in any occupational/technical program. In fact, the demand for PVCC graduates appears to be quite high within the PVCC service region. The program with the highest ratio of graduates to jobs was Respiratory Therapy, but even in that program, 1.67 jobs are available for each graduate. In three programs, students outnumbered job openings. These programs were Mechanical Technology (4.1 students for each job), Computer Systems (2.1 students for each job), and Accounting (1.2 students for each job).

Again, caution should be exercised when examining these figures. Graduate surveys, conversations with faculty, and personal contact with graduates do not necessarily reveal that students earning degrees in these programs have difficulty obtaining jobs.

CONCLUSIONS

Occupational/technical students typically constitute roughly one-third of all curricular students and FTES enrolled at PVCC. Of these occupational/technical students, nearly one-third are enrolled in the Business and Management program. The next largest programs in terms of student enrollment are Nursing and Computer Information Systems. In terms of completion, approximately one-half of all graduates receive degrees or awards in occupational/technical areas. Occupational/technical students, in other words, are much

more likely to complete their degrees or award programs than are college transfer students.

Measuring AAS programs during a three-year average period against SCHEV productivity standards, four programs--Business and Management, Computer Information Systems, Nursing, and Police Science--met both FTES enrollment and graduation standards. Two programs--Business and Office, and Electronics--met FTES enrollment standards but did not meet graduation standards. Two programs--Mechanical Technology and Respiratory Therapy--met neither FTES enrollment nor graduation standards. Respiratory Therapy was discontinued in 1991-92.

Generally, the growth rates for occupations for which PVCC occupational/technical programs prepare workers are quite high. Similarly, there seem to be ample job opportunities in occupations for which PVCC occupational/technical programs prepare workers.

RECOMMENDATIONS

The only recommendation emerging from this study is the same one that appeared in the 1991 follow-up study, and that is to intensify efforts to insure that students are correctly coded in the VCCS SIS database with respect to their curricula. As noted in that study:

> Perhaps, once a year, early in the fall semester, a list of all students enrolled in all programs should be generated by the Office of Administrative Computing. This list could be used by the dean of instruction, division chairs, and program chairs to insure that students on the list are actually enrolled in various programs and that students enrolled in a program and not appearing on the list are added. Additionally, once a semester, the Office of Administrative Computing could generate a list of students enrolled in discontinued

programs. Such a list could be used by the dean of instruction, division chairs, and A&R to correctly code all students listed.[12]

It is important that students be coded accurately in the VCCS student database. In these times of public accountability and fiscal restraint, failing to do so could jeopardize the very future of a number of instructional programs at PVCC.

[12] *Ibid.*, p. 23.